

AVID Boron

AVID's trio of MCs are distinguished, principally, by choice of cantilever. The mid-range model uses boron in place of ruby, saving a whopping £2000. Is this the sweet-spot?

Review: **Ken Kessler** Lab: **Paul Miller**

Here we go again: a moving-coil cartridge that costs more than I paid for a near-mint, limited-edition Series 2 Mazda MX-5.

With the rare hardtop. That said, I am sure AVID priced the Boron at £4000 for good reason, but let's skip over the entirely moot concept of 'value for money' and deal, instead, with sound quality. So the AVID Boron is the middle model in a three-cartridge lineup, and thus sells for a substantial £2000 less than the flagship Reference Ruby [*HFN* Nov '20].

Aside from a boron cantilever instead of ruby, hence the models' names, the Boron is identical to the company's flagship model, with the same micro-ridge stylus, tracking force and impedance. The entry-level Ionic has an aluminium cantilever, but an elliptical



LEFT: The Boron's packaging is modest compared to the Ruby's machined 'A-frame', but this anodised alloy drum is beautifully turned out and more secure than a pretty wooden box!

stylus, so comparisons of that model with its dearer siblings isn't simply a matter of varying cantilevers. You open up that other can of worms, which is the sound of different stylus profiles. Hey, I even know audio sages who swear by conical.

But many more of you have already experienced the underlying feature of this review, which is this – beyond any doubt, cantilever materials *can* make a big difference to performance, as demonstrated by the Boron vs. the Ruby [see PM's boxout, below].

PECKING ORDER

Here's a thought for cartridge fetishists – what no-one has yet developed, as far as I can determine, is a pecking order for which of the following is the most important in defining a cartridge's sonic character: stylus profile, cantilever material, length, magnet type, internal wiring type, body material, body removal, etc.

Each parameter, I'm certain, has its own adherents, from brand-to-brand. Ultimately, though, it is a combination of all of these, so it's as arguable as whether or not a car's tyres are more influential than the dampers or steering when it comes to handling.

AVID is not alone in differentiating its top models by cantilever. Others include Koetsu, with its diamond cantilever option, Ortofon, Soundsmith, Lyra and, of course, Dynavector, who set the whole

ruby/diamond cantilever thing ablaze some 40 years ago with its DV-17D and DV-23R pick-ups.

As AVID is following a logical, manageable and valid path to model differentiation, and as other materials also work for cantilevers, there is even scope for the brand

CANTILEVER TUNING

What makes the perfect cantilever? As the 'direct link' between the stylus and groove at one end and, in an MC, the coils at the other, the ideal cantilever needs to be both very stiff and very lightweight to accurately convey the groove modulations. The mechanical behaviour of the cantilever under load, and the damping afforded by the rubber suspension at the pivot point are also crucial in determining the tracking performance of the cartridge. A fine alloy pipe remains common in MM designs where, in more sophisticated designs, the resonance of the tube and finite mass of the crimped and glued stylus-end may be employed constructively to 'tune' the HF response of the generator mechanism.

More exotic materials have proved popular in high-end pick-ups since 1979 when Dynavector launched its Karat Diamond and Ruby MCs [*HFN* Nov 1980] and Technics used a boron pipe in its more affordable EPC-205 MM [*HFN* Dec 1980 & Sep '18]. Diamond is not only the hardest natural material but its stiffness, inferred by a Young's Modulus of 1100GPa, is 2-3x that of ruby and some 15x that of aluminium, although it is slightly denser, increasing the cantilever's moving mass. Boron, while lacking the cachet of ruby or diamond, is arguably a better choice of cantilever material: it is more affordable and combines a Young's Modulus of 660GPa – still harder and 'stiffer' than ruby – with a lower density than even aluminium.

Working with boron is trickier though, for while ruby rods will accommodate a fine diamond stylus mounted through a laser-drilled hole, these same stones must be glued to the chamfered tip of a boron rod. In practice even ruby or boron cantilevers have their own unique resonances that impact on the HF performance, and sound, of the pick-up [see Lab Report, p67]. PM



to add models which fill the price gaps between the Ionic, Boron and Reference Ruby. For experienced enthusiasts there's an unexpected benefit to all of this. Thanks to other MCs using aluminium, boron, diamond, ruby, *et al*, we already know that these materials instil repeatable, characteristic sounds. What this means for the end-user, is that you can, with AVID's cartridges and others, simplify your selection process with this knowledge and, for example, rule out diamond cantilevers for a system that's a bit 'zippy' at the top, as diamond might exacerbate it.

As confirmed by PM's Lab Report [p67], the move from the Reference Ruby to the Boron goes hand-in-hand with a measurable and predictable behaviour, and there were thus few surprises. Of course, anyone spending this amount of money on a cartridge will expect a controlled demonstration, and any AVID retailer prepared to part you of £4000 or £6000 for a cartridge should be equipped for comparing the two designs.

My own findings were so consistent with both PM's measurements and the aforementioned known traits of the materials that I'll present this to you not as chance to save £2000 but as a means of tuning your system. By this stage, we have accepted that we're in the loony-tunes pricing sector and that financial prudence has long been abandoned!

SILKY CUTS

Having already fitted a Reference Ruby, I was prepared for the long, exposed cantilever daring me to snap it. That threat aside, this cartridge is a dream to install, and I noted that the new stylus cover is a tight fit, as opposed to the cover of the earlier Ruby which had a tendency to slide off. Meanwhile, the flat sides aid in alignment, while the space between the underside of the cartridge and the playing surface means you have a clear view of whichever alignment template or protractor that you are using.

The Boron worked beautifully with a tracking force of 2g, and – through three different phono stages pressed into service – sounded best loaded with 100ohm. Aside from PM's observations about its actual

RIGHT: Substantial, threaded alloy mounting plate and body is shared across all three of AVID's MCs. Once again, the cantilever is very exposed but this does make for swift and accurate cueing



stylus rake angle, this is as easy to install as any high-end cartridge I can name. I also noticed more so with this cartridge than the Reference Ruby what PM describes as the 'hotter' right channel.

This was, for whatever reason, particularly noticeable on *LaVern Baker Sings Bessie Smith* [Speakers Corner/ Atlantic 1281] rather than on the other LPs I used for the sessions, but not so much that I was reaching for the balance control. As an experiment, I tweaked the anti-skating, which improved matters slightly, but we are talking minute amounts.

Believe me: I am not interested in exacerbating the paranoia that is innate to many audiophiles.

Leaving such concerns to the sort who set up cartridges with laser pointers and microscopes, the rest was blissful. I knew Baker's voice intimately from years of adoring her, but this new pressing and the jazzy-interpretations-of-blues-classics showcased her voice with the warmth cranked up a few degrees. This immediately slapped me upside the head,

LEFT: Seen end-on emerging from a gold-plated yoke, the boron cantilever is equipped with a 3x70µm 'micro-ridge' stylus – mounting and polish are first class



reminding me that I was to compare this to the Reference Ruby and the known differences in the nature of the cantilevers.

Was it the record or the cartridge? The space, the snap, the warmth – they recalled the Reference Ruby, but with less aggressively forensic exposure. Nothing was lost – it was simply presented in a less

dogmatic, less forceful way. Because I had my doubts about expressing these differences so emphatically without using like-with-like, I dug out all of the LPs I played when auditioning the Reference Ruby pick-up and stayed with the cartridge

'The space, snap, warmth all recalled the Ruby'

feeding the EAT E-Clo phono stage, which I had set to just over 100ohm.

With notes to hand, I even repeated the Ruby listening sessions' playing order. Why? Because music determines moods and I wanted to ensure that the conditions were identical. Again, commencing with the new LP of Gene Clark's *No Other* from the extensive box set [4AD 0071 MXX], I once more heard a rich and glorious midband, but with an even silkier top-end than the Ruby's, which has its own delicious sheen.

GUT INSTINCT

As bizarre as this might seem, the disparity reminded me less of cantilever variances than the sound of different valves. If you are a tube-ophile, you will appreciate what I mean when I say the Boron sounded like a KT77 while the Ruby resembled a KT88. Subtle, obscure, minuscule, perhaps, but it was repeatable with every song, especially the gripping title track. What bothers me is the impression I might be creating, that ☺

CARTRIDGE

RIGHT: Exposed boron cantilever is clear to see, as are the coils on the other side of the CNC laser-cut yoke. Colour-coded cartridge pins are chamfered so care is needed to ensure a snug fit

Boron versus Ruby describes some vast sonic chasm. This is not the case. I am labouring to describe such minute differences with precision so as *not* to suggest a situation that characterises the two cartridges as mutually exclusive, which I also said about the titanium-bodied TechDAS TDC01 Ti [HFN Sep '14] when I compared it to the Ruby.

They most certainly are not either/or, so you mustn't expect a quick A/B listening session to make up your mind for you. But seasoned listeners and experienced audiophiles – who else spends this kind of money on a cartridge? – will surely hear these variances through a controlled demonstration.

The trick will be hearing them through a neutral system which favours neither. My gut instinct tells me that one should audition the two through full-range electrostatic loudspeakers, driven by solid-state amps of an ice-cold mien.

ROCK SOLID

While I was dazzled by the atmosphere of menace that the AVID Ruby conveyed, the Boron nearly managed the same but with a teensy reduction in absolute stage depth. I'm in no position to confirm this was an artefact of cantilever behaviour, but it was certainly detectable. That said, the Boron's stage width and three-dimensionality perfectly matched that of the Ruby, despite the latter being a touch more open-sounding.

What proved useful about the mono pressing of The Remains' eponymous debut [Epic LN24214] was another go at experiencing PM's observation about the slight channel discrepancies, which had little effect on the precisely centralised location of the music. Perhaps I am imagining this but – and this is without recourse to using the mono button on my preamp, which I employ when listening to mono LPs – the Boron actually seemed to create a more rock-solid centre image.

That actually added to the belief that the Boron and the Ruby can co-exist peacefully in



the same catalogue (again, price notwithstanding) with more than just the top-end attack and absolute precision being their main differences. Rather, I also noted with all of the recordings that the bass was drier with the Ruby, and less forceful with the Boron. Again, it was The Remains' power track, 'Don't Look Back', with its manic percussion, that allowed me to appreciate how the two differ.

To put this into practical terms, I'd imagine the Boron would benefit those loudspeakers with ultra-tight, snappy bottom octaves, while the Ruby shines through 'bottomless-pit'-type speakers, *eg*, those with lots of woofers with tuned ports. With either AVID moving-coil, the bass is deep enough to satisfy a hip-hop devotee or those who listen to Kodo drums for pleasure. ☺

HI-FI NEWS VERDICT

Boron versus Reference Ruby addresses a sonic trait that's not qualitative, so scoring is identical. This exceptional cartridge is differentiated from the Ruby by being more ear-friendly and less critical of the rest of the system. In some set-ups, then, the Ruby's arch precision, attack and speed will be preferred and exploited. For a more relaxed experience, though, the Boron is the ticket. And you saved £2000...

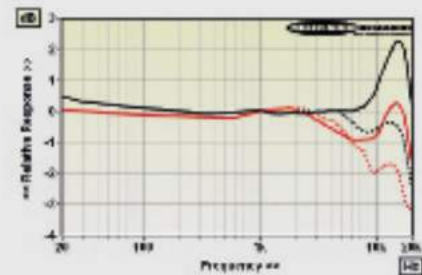
Sound Quality: 88%



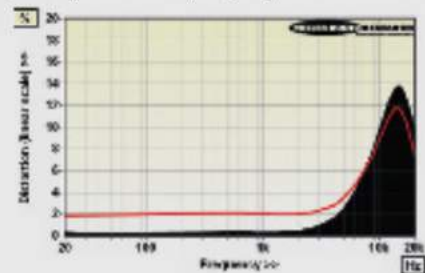
AVID BORON

This, to all intents and purposes, is AVID's flagship MC [HFN Nov '20] but with the ruby cantilever replaced by a boron rod of equivalent length [see boxout, p64]. It shares the same 3x70µm 'micro-ridge' diamond, suspension and 9g bodyweight, yielding (you guessed it) the same low 9cu compliance for compatibility with higher (1-16g) effective mass tonearms. Again, AVID has limited the coil windings – the impedance is a low 4.5ohm – to reduce its moving mass, but this also limits the output that can be generated. Its 0.32mV/1kHz (re. 5cm/sec) is identical to the Ruby, as is the 23-28dB (20Hz-20kHz) stereo separation, though channel balance was a tighter 0.1dB from this Boron sample. Once again, the Boron's VTA looks closer to 30° than the usual 20-24° and while its 'stiff' compliance is unchanged it's not quite as secure a tracker as the Ruby Reference, achieving ~70µm via the left/right channels and just letting go at the penultimate +15dB groove modulation (re. 315Hz/5cm/sec) at ~1% THD.

However, when it comes to frequency response and THD, the specific resonances and damping properties of boron versus ruby play out to yield very individual results. The slight asymmetry in AVID's generator is once again revealed in the 'hotter' right channel but here the 'kick' is a milder +2.3dB at a higher 16kHz on lateral (L+R) cuts coupled with a -0.9dB presence *dip* on vertical (L-R) grooves [solid traces, Graph 1]. The left channel [dashed traces] has less overall treble energy (-3.0dB and -1.6dB/20kHz, lateral and vertical) while distortion is uniformly lower on both channels compared to the Ruby. Via the right channel, HF distortion peaks at 14% via the Boron versus 20% with the Ruby (-8dB re. 5cm/sec), as illustrated in Graph 2. PM



ABOVE: Freq. resp. curves (-8dB re. 5cm/sec) lateral (L+R, black) vs. vertical (L-R, red). L channel dashed



ABOVE: Lateral (L+R, black infill) and vertical (L-R, red) tracing and generator distortion (2nd-4th harmonics) vs. frequency from 20Hz-20kHz (-8dB re. 5cm/sec)

HI-FI NEWS SPECIFICATIONS

Generator type/weight	Moving-coil / 9.1g
Recommended tracking force	18-22mN (20mN)
Sensitivity/balance (re. 5cm/sec)	317µV / 0.1dB
Compliance (vertical/lateral)	9cu / 8.5cu
Vertical tracking angle	30 degrees
L/R Tracking ability	70µm / 70µm
L/R Distortion (-8dB, 20Hz-20kHz)	0.47-17.5% / 0.35-13.8%
L/R Frequency resp. (20Hz-20kHz)	+0.4 to -2.4dB / -0.2 to +2.3dB
Stereo separation (1kHz / 20kHz)	28dB / 23dB